



# Exchange of Best Practices Within the European Union: Surgery Standardization of Abdominal Organ Retrieval

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## ABSTRACT

Considering the growing organ demand worldwide, it is crucial to optimize organ retrieval and training of surgeons to reduce the risk of injury during the procedure and increase the quality of organs to be transplanted. In the Netherlands, a national complete trajectory from training of surgeons in procurement surgery to the quality assessment of the procured organs was implemented in 2010. This mandatory trajectory comprises training and certification modules: E-learning, training on the job, and a practical session. Thanks to the ACCORD (Achieving Comprehensive Coordination in Organ Donation) Joint Action coordinated by Spain and co-funded under the European Commission Health Programme, 3 twinning activities (led by France) were set to exchange best practices between countries. The Dutch trajectory is being adapted and implemented in Hungary as one of these twinning activities. The E-learning platform was modified, tested by a panel of Hungarian and UK surgeons, and was awarded in July 2013 by the European Accreditation Council for Continuing Medical Education of the European Union of Medical Specialists. As a pilot phase for future national training, 6 Hungarian surgeons from Semmelweis University are being trained; E-learning platform was fulfilled, and practical sessions, training-on-the-job activities, and evaluations of technical skills are ongoing. The first national practical session was recently organized in Budapest, and the new series of nationwide selected candidates completed the E-learning platform before the practical. There is great potential for sharing best practices and for direct transfer of expertise at the European level, and especially to export this standardized training in organ retrieval to other European countries and even broader. The final goal was to not only provide a national training to all countries lacking such a program but also to improve the quality and safety criteria of organs to be transplanted.

**T**HE NUMBER of patients registered on waiting lists for organ transplantation is steadily increasing. This growing organ demand is notably due to the fact that indications for organ transplant have been extended, that some countries started new transplant program development activities, and that most advanced countries need to find solutions to increase the efficiency of their donation and transplant systems. As a partial solution to overcome this lack of organ supply, some countries have extended

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donor criteria; others have developed living donation programs or worked on donation campaigns. Many complementary actions can be established at different levels of the donation and transplantation system [1,2]. One is to reduce the risk of injury during retrieval surgery, which is potentially devastating for the recipient or can frequently lead to the discard and loss of the graft-to-be. To this end, training surgeons at the national level is crucial to secure and ensure the quality of organs to be transplanted.

In the Netherlands, a complete trajectory of training, certification, and accreditation has been developed to train surgeons in the surgical specification of abdominal organ retrieval; it was implemented in 2010. A national committee including the supervisors of the 5 national retrieval teams monitors 32 Dutch surgeons who have completed or are still in training to further the quality of the retrieved organs. The Dutch curriculum includes an E-learning [3] tool developed by the Leiden University Medical Centre, the University Medical Centre Groningen, and the Dutch Transplant Foundation, and a competence assessment form signed by the tutor evaluating the technical skills of the trainee (Table 1). In addition, the participation in the Masterclass on Retrieval Surgery (with hands-on sessions and procedures of organ recovery on preserved human bodies) is mandatory for certification. This 2-day practical session is organized annually in close collaboration with the European Society for Organ Transplantation (ESOT) and is open to candidates from all over the world.

Following the Directive 2010/53/EU (“on standards of quality and safety of human organs intended for transplantation”) [4] that all 28 member states (MS) of the European Union had to transpose to national laws and implement, and the “Action Plan on Organ Donation and Transplantation (2009–2015): Strengthened Cooperation between Member States” [5] of the European Commission, a 3-year joint action (calling all MS for participation), the Achieving Comprehensive Coordination in Organ Donation (ACCORD) program was co-funded by the European Commission Health Programme. ACCORD [6] is led by the Organización Nacional de Trasplantes in Spain. Within ACCORD, 1 section is devoted to 2-year twinning activities led by the Agency of Biomedicine (ABM) in France, which concerns the provision of operational, direct, and cost-efficient transfer of expertise from an experienced supporting MS to a seeking supported MS. Twinning is to help supported MS in reaching their full potential and bring more harmonization of practices, within the remit of the EU

action plan and Directive 2010/53/EU. Finally, 3 different twinning activities were set with a budget of €80,000 per pair; the twinning described here between the Netherlands and Hungary is one such activity.

In Hungary, the Organ Coordination Office (OCO) within the Hungarian National Blood Transfusion Service (HNBTS) is responsible for the coordination of organ donation until retrieval. OCO is responsible for the coordination, support, and improvement of organ donation; it is also in charge of the collection, analysis, and evaluation of data associated with the different activities of the donation and transplantation subprocesses, in accordance with national laws [7].

Hungary has 6 transplant centers located in 4 regional areas, each with a kidney transplant program. In Hungary, 1 liver program has been established in Budapest, and 2 centers transplant the pancreas in Budapest and Pécs. To date, surgeons from all 4 centers can retrieve kidneys. Surgeons from the Semmelweis University Medical Centre (SUMC) of Budapest will move to procure liver and pancreas in other regions upon request while colleagues from Pécs can also retrieve pancreas and kidneys. The SUMC is one of the largest transplant centers in Middle-Eastern Europe and currently performs 60% of Hungary’s organ transplantations.

The first goal of this twinning between the Netherlands and Hungary was to set up a national training program for abdominal organ retrieval in Hungary, adapting the Dutch curriculum for surgeons and Dutch IT tools, to optimize safety and quality criteria of organs to be transplanted. The broader aim was to assess the potentiality of having a new international training tool available at the European Union level for other MS.

## MATERIALS AND METHODS

Both candidates for twinning activities applied to the ABM in France to shape medical, scientific, and financial contents of their proposal, in accordance with the ABM criteria and the outline of twinning activities. Selection of this twinning proposal was agreed by the ACCORD consortium. Participating partners are the Dutch Transplant Foundation (overseeing action in the Netherlands), Leiden University Medical Centre, and University Medical Centre Groningen, together with the ESOT; on the Hungarian side is the HNBTS-OCO (overseeing Hungarian actions) and SUMC. ABM has to provide continuous guidance, conduct follow-on actions and implementation, evaluate twinning execution, and provide solutions for problems encountered. ABM also has to regularly report to the Organización Nacional de Trasplantes, who acts in cases of deviance and reports to the European Commission on all actions and outcomes of the overall ACCORD joint action.

This transfer of expertise was set up in 2 phases. A pilot phase testing the system with 6 Hungarian surgeons from SUMC comprised several stages. The first stage included a visit of the Dutch senior surgeons to Hungary, presentation of the Hungarian organizational system for organ retrieval, and presentation of the Dutch training trajectory. Second, adaptation was made of the Dutch E-learning platform to international needs. The E-learning program contains 12 chapters and includes expertise transfer to

**Table 1. Minimum Numbers of Organ Retrieval Procedures to be Performed Under the Dutch Curriculum**

Procedure	Assistant Surgeon	Main Surgeon
Procurement of kidneys from deceased donors	20	20
Procurement of pancreases (including retrieval for islets)	10	2
Procurement of livers from deceased donors	10	10

better understand, perform, and complete an abdominal multiorgan retrieval procedure. The E-learning is supported by step-by-step visualization of the surgery and exercises that can be accessed and completed at the learner's convenience [8,9]. Each topic or screen that the trainee accesses is reported and includes relevant questions that have to be answered to allow continuation and completion, before the pass mark of successful completion is granted. Third, selection was made of the 6 Hungarian surgeons from SUMC for the pilot phase of the training: 3 junior surgeons and 3 senior surgeons, who will in turn be tutors (train-the-trainers method). The 3 tutors were selected due to their position and experience and in close collaboration between the HNBTS-OCO and the head of the Department of Surgery of SUMC. The junior surgeons were selected by the Hungarian tutors. Fourth, the Hungarian surgeons completed their E-learning and evaluated the platform by using a dedicated questionnaire (5 questions to be answered [with the following possible answers: nothing/not at all/poor, very little/mediocre, sufficient, a considerable amount/good, or a lot/excellent] followed by 3 open-ended questions). Fifth, the 6 Hungarian surgeons of the pilot phase were to attend the ESOT Masterclass in Leiden and be evaluated; in addition, 1 observer was sent for the experience of session organization. During this Masterclass, the Hungarian tutors joined an extra "train-the-trainer" course during which the methods of the training trajectory were explained. The sixth stage encompassed training-on-the-job activities (number of organs to retrieve either as a main surgeon or as an assistant). For all organs retrieved and going through the allocation system, a declaration and duly completed form is sent to the OCO. The OCO then records the assistant and main surgeon in charge of the retrieval, and reports on procedures performed by trainees. Each trainee having completed the E-learning platform will be evaluated by tutors during the Masterclass.

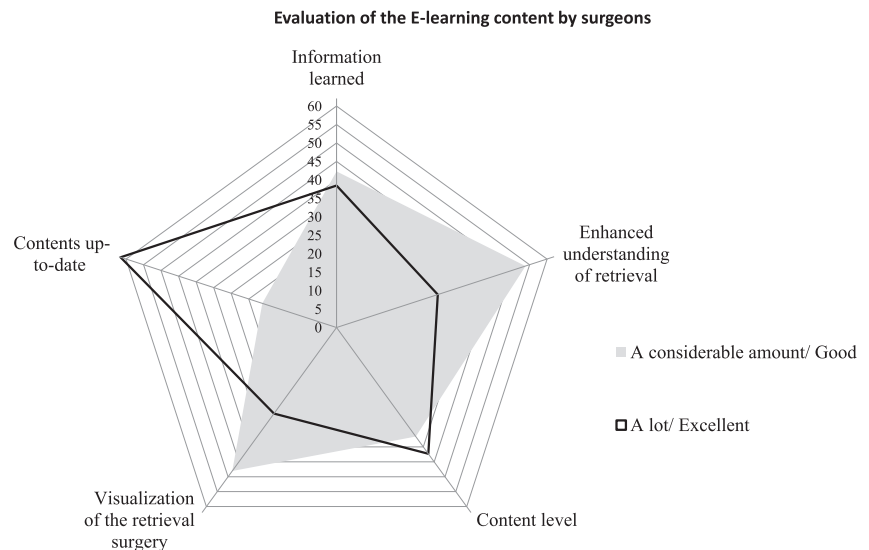
Phase 2 focused on setting the national training and entails the following: a satellite Masterclass organized in the transplant center of another region (Debrecen); recruitment of new surgeons from all regions to be trained at the national level; and making E-learning and Masterclass available in Hungary at the national level for all interested surgeons and under tutor supervision. During this first national Masterclass, both tutors from the Netherlands and from Hungary evaluated the technical skills of trainees; this opportunity

was made to compare evaluations. For the next stages, evaluation shall be made by the Hungarian tutors.

## RESULTS

The E-learning content was extended to major browsers and cross-operating system playability, increasing its speed, and is now accessible for personal computers, Macs, and tablets. Users have a log-in and can follow completed modules. HNBTS-OCO is now able to create, modify, or delete user accounts, to grant access to the E-learning platform, and to follow completion.

The Hungarian surgeons from the pilot phase successfully completed their E-learning and have evaluated the platform. As a complement, ESOT recruited volunteer candidate retrieval surgeons from the United Kingdom to test and evaluate the E-learning platform as well, leading to a total of 52 evaluations (Fig 1). Similar positive appreciations were collected from testers: "learned a considerable amount," 42.3%; "learned a lot," 38.5%; "helpful to get a broader view on organ procurement: a considerable amount," 53.8% and "a lot," 28.8%; "good level" 36.5% to "excellent level" 42.3%; "visualisation of the retrieval procedure: good" 48.1% and "excellent" 28.8%; "updated content: good" 46.2% and "excellent" 36.5%"; and 61.5% ranked the content of the E-learning platform as excellent in terms of usefulness. In addition, testers issued valuable recommendations to further improve the E-learning platform by answering open-ended questions about the main strengths, opportunities for improvement, and other remarks: praise (86.5%) was given for the extensive content, the illustrative step-by-step procedure of the surgery, and for the interactivity of the E-learning. Opportunities for further improvements (44.2%) involved the content (eg, extra chapters such as complications during procedure and thoracic organ retrieval), extra-illustrative views in the module (eg, intraoperative video-fragments, the aberrant



**Fig 1.** Evaluation of the E-learning Platform by 52 Surgeons. Opinion of Hungarian and UK surgeons expressed as percentage; limited to answers from most significant questions. Answers to be selected from: "nothing/not at all/poor, very little/mediocre, sufficient, a considerable amount/good, or a lot/excellent."

anatomy), and further improvement of the functionalities of the E-learning (eg, print-out possibility results, interactivity, speed).

The E-learning platform was accredited by the European Union of Medical Specialists and the European Accreditation Council for Continuing Medical Education and was granted 4 European continuing medical education credits. HNBTS-OCO applied in turn for an accreditation for this E-learning (8 credits) and for the Masterclass (20 credits). This optional training is now available within the continuous education program for medical physicians in Hungary.

Five Hungarian surgeons of the original 6 from the pilot phase followed the ESOT practical (hands-on) session; the sixth surgeon will attend the next one session. Some more junior surgeons were recruited; to date, all junior surgeons' training-on-the-job procedures have been reported by OCO (Table 2). The Masterclass, the technical skills evaluation, and the training-on-the-job procedures are ongoing at the time of this publication. Discussions between the Scientific Committee of the Hungarian Donor Surgery and OCO regarding the finalization of the honorary certification of Hungarian surgeons in abdominal organ retrieval (Hungarian curriculum) are currently underway, especially regarding the training-on-the-job-procedures that have to be adapted from the Netherlands (Table 1), in accordance with the level of activities in Hungary. Nevertheless, according to the reported training-on-the-job activities thus far, surgeons 1 and 3 would already comply with the level of Dutch liver retrieval activities.

The satellite Masterclass in Debrecen introduced the E-learning platform and the multiorgan retrieval practice. Some participants showed interest in the national training and were granted access to the E-learning platform as well.

For the national Masterclass in Budapest, the Department of Human Morphology and Developmental Biology and the Department of Transplantation and Surgery of SUMC are cooperating to support liver surgery, especially the split liver technique. The working group at the Department of Human Morphology and Developmental Biology elaborated on a dye technique that can visualize arteries, veins, and bile ducts beyond the computed tomography scan imaging. Hence, it is possible to study the anatomic variants of these structures. Two surgeons from each of the 4 Hungarian transplant centers were selected,

granted access to the E-learning platform, fulfilled modules, and had their technical skills evaluated during the Masterclass.

## DISCUSSION

The aim of twinning activities was to facilitate the implementation of Directive 2010/53/EU to improve the quality and safety of organ donation and transplantation. Setting up a national training program in organ retrieval for Hungarian surgeons was targeted toward standard operating procedures and qualifications of personnel as noted in the directive. In addition, it is also in line with the action plan regarding the development of professional knowledge on transplantation, the promotion of quality improvement program, exchanges of best practices, and the promotion of European Union-wide agreements on aspects of transplantation medicine.

The Dutch E-learning platform was adapted to international use and to all supports within a short time and with minor changes; in addition to being offered in Hungary, it is now available for professionals in any other country. The second component of the training program dealt with the Masterclass, as a complement to the theory; the practical hand-on sessions are now organized nationally in Hungary. The train-the-trainer method applied seemed to be successful; it started with 1 university hospital center and was extended to all regional transplant centers. Tutors are trained, and selected candidates have to successfully complete the E-learning platform before attending the practical session. Both are now part of the national Hungarian training program and have been rewarded with educational credits.

A less immediate outcome adaptation of the full Dutch curriculum is the training-on-the-job procedures to be performed by trainees, as the volume of procedures could be adapted to the level of Hungarian activities, especially for pancreas procurements. At the national level, the implementation of this curriculum involves the cooperation of university medical centers, peripheral hospitals, politics, and different authorities. The establishment of the curriculum has a significant impact on structure, processes, and legislation, and it requires agreements about qualification criteria, certification, and, when applicable, on the accreditation policy of surgeons. Due to its complexity, it is still under discussion. It is important, however, that training-on-the-job activities should be structured, evaluated, and monitored. This review requires a sustainable organization, which was placed in the remit of both the Hungarian Transplant Society (final approval of candidates) and the OCO as responsible for this national curriculum.

However, this transfer of expertise may also have some limitations. The objective of the Dutch curriculum is to optimize retrieval of organs to allow for more transplantations. Because this is not the direct primary goal of this twinning, this objective has not yet been addressed. Further research is required to prove if this curriculum leads

**Table 2. Training-on-the-Job Ongoing Procedures of the Hungarian Trainees Reported by OCO**

Surgeon	Kidney Retrieval		Liver Retrieval		Pancreas Retrieval	
	Assistant Surgeon	Main Surgeon	Assistant Surgeon	Main Surgeon	Assistant Surgeon	Main Surgeon
1	10	20	9	22	–	–
2	13	6	12	4	1	–
3	4	14	2	17	–	2
4	–	8	–	6	–	–
5	9	4	6	7	2	–

Abbreviation: OCO, Organ Coordination Office.

to a lower incidence of organ injury or even reduction of the loss of organs judged to be untransplantable. A good indicator for Hungary could be tracking and tracing of organ retrieval incidents to be reported via the mandatory evaluation procedure form that is completed by the surgeon in charge of the organ retrieval. We must remember that to ensure a high quality of the retrieval procedure, not only the competent surgeon but the complete retrieval team contributes to the quality of the organs to be transplanted. The surgeon is only as good as his or her team, and thus a broader training system for the team, including coordination programs, should be considered. In the interim, Hungary came one step closer to develop its multiorgan procurement programs.

Importantly, additional MS have shown interest in subscribing to the E-learning platform, having already either a national practical session or considering sending their trainees to the European Donor Surgery Masterclass (organized annually by the ESOT in Leiden). As expected, tools developed by a given MS can meet the needs of others.

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